BASUTOLAND

ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR ENDING 30 SEPTEMBER

1948

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For the Year ending 30th September, 1948

SECTION I

REVIEW

THE TERRITORY

1. Basutoland is bounded by the Orange Free State and Natal in the north and the Cape Province of the Union of South Africa in the South. 11,716 square miles in area, the Territory lies between 28° 35′ and 30° 40′ South latitude and between 27° and 29° 30′ East ongitude.

A geological survey has shown the absence of minerals in payable quantities and so the future can hold out no prospects of any development in this direction. The wealth of the Basuto Nation must, therefore, lie in agricultural production. The chief exports, at present, are wheat, wool, and mohair which during the season under review brought in revenue approaching an estimated figure of £900,000 to the growers and professional transport riders. Approximately 60,000 Basuto men are normally absent, working in the mines and on farms in the Union of South Africa, this being a further source of "outside" revenue.

3. The staple foodstuffs are maize and kaffir corn, although wheat is being increasingly used in the mountain areas, and in the southern lowlands.

4. It is estimated that of the 7,498,240 acres in the Territory, about 1,120,000 acres are under cultivation. Four-fifths of the country is steeply mountainous, the altitude varing between 5,000 feet and 11,000 feet.

5. The average rainfall is 29 inches. There is practically no timber in the country, cattle dung providing the main source of fuel.

Soil Conservation Measures

6. (a) *Terracing:* In the Lowlands, comprising approximately one-fifth of the area of the Territory, the soils are largely exhausted and the water absorptive capacity is very low, and "run off" high. On the steeper slopes, therefore, graded terrace banks are constructed by mechanical means, but on the more gentle slopes, buffer strips in conjunction with terrace banks are used to check erosion.

7. (b) *Grass stripping:* A large proportion of the arable land of the Territory is quite inaccessible to wheeled transport, and therefore, to mechanical means of construction of erosion control works. As an alternative, strips six feet wide are surveyed on the contour, at six feet vertical intervals through all cultivated lands, and allowed to revert to their natural vegetative covering. Strips are also surveyed through virgin grassland which is to come under the plough. The six feet vertical interval between strips, which is insisted upon, has the effect of restricting cultivation to those mountain slopes where the grade is not too steep for arable purposes.

8. Grass stripping in the mountains is being supplemented by manually constructed graded training banks, placed where possible at the top of cultivation on slopes to divert storm run-off from higher ground.

9. (c) *Controlled grazing:* Systems of rotational grazing have been introduced in a number of centres with the object of improving grazing, or, as is more often the case, allowing the re-establishment of proper grass cover on the mountain slopes. Further reference to this is made in paragraphs 77 and 78.

10. (d) *Dam construction:* To obviate the necessity of stock walking long distances to and from water, with resultant damage to herbage, the construction of earthen dams at frequent intervals in the lowland section of the Territory is a policy which is systematically being followed. (For details of Soil Conservation, refer to Sect. IV of this Report.)

Fertility of Arable Land

11. (a) The Basuto commonly use kraal manure as a fuel supply. By every possible method, including the provision by Government on loan of a number of two wheeled carts, the people are being urged to return kraal manure and village refuse to the soil. Concurrently,

a tree planting campaign has been initiated, in order to provide an alternative fuel in an otherwise practically fuel-less country. A system of subsidising the application of kraal manure and ash to arable land is showing promising results. (For details refer paragraphs 53 and 54.)

12. (b) As a temporary wartime expedient, superphosphate has been used in the Territory. It is felt that this is incorrect as a long term policy, and the use of superphosphates is not being encouraged, except in conjunction with the use of organic manure.

13. (c) Rotation of crops, and the greater use of legumes in the rotation, are being fostered.

14. (d) Experiments are in progress to demonstrate the value of grass leys for soil regeneration, including in "treatments" the use of local, free-seeding perennial species.

Livestock and Crop Improvement

15. (a) *Wool:* The major export from the Territory is wool. In 1935 a system was initiated providing for the introduction of pure bred Merino rams, combined with the castration of all locally bred rams of undesirable type. Since that date there has been a regular importation annually by the Department of many hundreds of Merino rams, which are sold at under cost price to the Basuto.

16. (b) *Mohair:* As a safeguard to the Mohair industry, the importation of goats of other than the Angora breed is prohibited. An account of a scheme for the improvement of goats is contained in paragraph 139.

17. (c) *Cattle:* In general, cattle importations are limited to the hardy Afrikander type, but individuals who are prepared to provide supplementary feeding are permitted to import cows of exotic breeds for their domestic milk supply.

18. A commencement has been made in the breeding up of a herd of native cattle, milk yield and ability to maintain condition on the natural veld being used as the first criteria for the selection of foundation stock. The object of this work is to produce animals of known ancestry for sale to the Basuto, which can withstand the rigorous conditions under which the native cattle have to exist during the winter.

Further reference to this scheme is contained in para. 101 et seq.

19. (d) *Horses:* Stud stallions of an approved type are maintained at four centres within the Territory. For the use of these a nominal service fee is charged to Basuto.

20. (e) *Poultry and pigs:* Small breeding pens of pure-bred poultry and pigs are maintained at Maseru for the issue of improved breeding stock as required.

21. (f) *Wheat improvement:* Breeding work, combined with variety trials, has been in progress for a number of years, the ultimate object being to improve yields and baking qualities of Basutoland wheat. Wheat, as at present grown, is of an exceedingly mixed type, and it is the aim of the Department to replace this with a strain or strains having qualities desirable from all points of view. (For details refer paragraph 81 et seq.)

22. As far as possible all wheat issued for seed is treated for smut.

23. Legislation has been introduced to prevent the spread of wild oats. This weed is becoming of increasing importance as a limiting factor in wheat yields.

Education

24. The education of the people of the Territory in better methods of agriculture is the main concern of the Agricultural Demonstrators. Teaching is effected by using a system of demonstration plots worked by the owners under the supervision and on the advice of demonstrators, combined with simple topical lectures. As far as possible, Basuto who have had training at one of the agricultural schools in the Union of South Africa are recruited for this purpose.

25. The work of this Demonstrators is supplemented by practical instruction given in school gardens and by publications. A quarterly bulletin is issued, containing instruction both in English and in the Sesuto language, in the agricultural operations which should be in progress each month.

26. Instruction is given by teachers all at schools in elementary agricultural subjects.

27. Two demonstration farms, of the approximate size of the customary arable holding of the Basuto family, viz :—about six acres have been established. All agricultural operations on these small farms are supervised by the Agricultural Officer in whose district the holding is situated. A statement showing the revenue obtained from these holdings is contained in Appendix A.

28. There is no provision within the Territory for higher agricultural training to be given at an institution.

Nutrition and Storage of Food

29. The first step towards rationalising the diet of the Basuto has been taken by the establishment, under the supervision of demonstrators, of individually owned vegetable gardens and the provision of seedling fruit (mainly peach) trees. The encouragement of vegetable gardening is at present considered one of the more important aspects of a demonstrators's duties.

30. In the course of time the milk yield of local cows should be improved by the cattle improvement scheme, to which reference has already been made, which will allow of milk entering more into the normal Basuto diet than is the case at present.

Agricultural Improvement Areas

31. Under various headings given, the policy in regard to the main aspects of land usage and conservation has briefly been outlined. With the approval of the Paramount Chief and the Basuto concerned, certain areas have been declared Agricultural Improvement Areas, in which a combined policy in regard to all matters has been brought into effect in an intensive manner. It is unfortunate that the Basuto are not at present prepared to consider the question of stock limitation, a matter of fundamental importance in a scheme of reclamation such as is required in Basutoland.

Standards for Exportable Produce

32. Prior to 1937 the classing of wool was not carried out, with the result that the Basutoland product generally commanded a relatively poor price on the overseas market. In 1937 a Government wool classing scheme was inaugurated whereby wool was sorted into a series of different classes under the supervision of qualified wool sorters. Steady progress has been made in this work, with greatly enhanced prices to the producer, and to-day over one-tenth of the wool exported is classed according to Government standards.

33. In 1942 it was found both necessary and desirable to improve the "get up" of the bulk of the wool which could not be handled by Government classers, and a scheme for the simple classing of wool, by the flock owners, was instituted. This has resulted in the raising of the standard of quality of the whole of the Basutoland

clip, and very encouraging reports are received from buyers as to the efficiency of the measures taken for improvement.

34. The bulk of the wheat is exported through Maseru and the Van Rooyen's Ports of Exit, where cleaning plants are established, and the wheat is cleaned and graded before export.

GENERAL

Staff

35. In April 1948 Mr. W. G. Leckie O.B.E., retired from the post of Director of Livestock and Agricultural Services. This position is to be filled by the appointment of Mr. J. G. M. King, M.B.E. formerly Senior Agricultural Officer, Tanganyika. Mr. Ross is shortly to be appointed as Veterinary Officer, and Messrs. A. Brightmore and W. Schefermann have been posted as Agricultural and Livestock Officer and Storekeeper respectively.

36. *Administration:* The actual strength and the approved establishment of the Executive Staff consist of :—

Approved Establishment	*Actual Strength*
1 Director of Livestock and Agricultural Services	1 Director of Livestock and Agricultural Services
1 Principal Veterinary Officer	1 Principal Veterinary Officer
1 Principal Agricultural Officer	1 Principal Agricultural Officer
1 Veterinary Officer	1 Veterinary Officer
1 Assistant Conservator of Forests	1 Assistant Conservator of Forests
1 Soil Conservation Officer	1 Soil Conservation Officer
4 Senior Agricultural & Livestock Officers	4 Senior Agricultural & Livestock Officers
8 Agricultural & Livestock Officers	7 Agricultural & Livestock Officers
1 Accounting Clerk	1 Accounting Clerk
1 Clerk Grade II	1 Clerk Grade II
1 Storekeeper's Clerk	1 Storekeeper's Clerk
7 Soil Conservation Foremen	6 Soil Conservation Foremen
1 Mechanic	1 Mechanic
2 Veterinary Assistants	2 Veterinary Assistants.
5 Clerks	5 Clerks
113 Demonstrators & Assistant Demonstrators	110 Demonstrators & Assis. Demonstrators
4 Forest Rangers	4 Forest Rangers
4 Nurserymen	4 Nurserymen

Weather Conditions

37. The season was characterized by a very unusual feature—adequate supplies of moisture for crop growth throughout the summer months. Rainfall continued into May and somewhat delayed the ripening of the maize and kaffircorn crops, which were subsequently damaged to a small degree by frost.
Excellent yields of all classes of food crops were harvested, necessitating especial arrangements for the disposal of the large surplus offered for purchase by the growers at the trading stations.
38. Average monthly rainfall figures recorded at the nine principal stations of the Territory are as follows :—

October	3·34	inches
November	3·60	„
December	5·92	„
January	3·97	„
February	4·33	„
March	7·38	„
April	2·33	„
May	1·14	„
June	—	„
July	·06	„
August	·06	„
September	·11	„
Total	32·24	inches

39. The above total of 32.24 inches is to be compared with the average rainfall for the Territory over the previous 32 years of 28.94 inches.

SECTION II

AGRICULTURE

A. Crop Production and Yields

40. *Maize and Kaffir Corn:* Sowing of these crops was somewhat delayed by the continuous rains during the planting months. The growing season was excellent, but in general difficulty was found in coping with the excessive growth of weeds. Ripening was delayed by the autumn rains, and the quality of some grain in the lowlands was lowered by a frost which occured early in May. The acreage under these crops exceeded that of the previous year, and very excellent yields were obtained generally.

41. TABLE I.—MAIZE AND KAFFIR CORN YIELDS

	Maize			*Kaffir Corn*		
	Demonstration plots		Check plots	Demonstration plots		Check plots
	Manured	Unmanured	Unmanured	Manured	Unmanured	Unmanured
Number	212	121	256	46	23	40
Area (acres)	558	279	650	172	76	134
Average yield per acre (lb.)	940	640	420	860	500	530

42. *Wheat*: Winter wheat is grown mainly in the south western lowlands. On account of a frost late in October, when the crop was in the "dough" stage, and of the general incidence of rust, the quality and yield of this crop was indifferent. No setback of any kind befell the mountain spring sown crop, from which excellent yields of good quality grain were harvested in February.

43. There is an increasing tendency for what lands in the mountains to be used for the production of maize, but the short growing season at these altitudes makes maize an extremely speculative crop, particularly on the higher slopes, It is considered that the high relative price of maize compared with wheat is responsible for this trend.

44. TABLE II.—WHEAT YIELDS

	Demonstration Plots		Check Plots
	Manured	Unmanured	Unmanured
Number	41	33	48
Area (acres)	46	120	118
Average yield per acre (lb.)	780	510	330

45. 84,000 bags of 200 lb of wheat were exported to the Union of South Africa during the year under review. On account of animal transport difficulties, very considerable stocks of wheat are being held at the mountain trading stations, which should form a useful reserve supply of food should a period of shortage occur. As has been stated in previous Reports, wheaten meal is now included in the normal diet of the mountain people to a very much greater extent than has been the case in the past.

46. *Beans:* A very small acreage was planted to this crop, the ripening of which was hampered by unsuitable weather conditions.

47. *Peas:* Excellent yields were obtained from the mountain

grown pea crop harvested in March, but the quality was somewhat spoiled by rains at threshing time. Yields of up to 1,600 lbs per acre were recorded. During the year permits were issued for the export of 55,000 bags of 200 lbs net to the Union, either for consumption there or for export overseas. Except to a minor extent as a fresh vegetable, peas do not enter into the diet of the Basuto, and are therefore to be considered purely as a cash crop.

48. *Oats and Barley:* Only a relatively small acreage is planted to these crops. Yields of barley grain and oat forage were excellent.

49. TABLE III.

The approximate agricultural production in 1948 and preceding years in bags of 203 lb. gross

Crop	1942	1943	1944	1945	1946	1947	1948
Maize	527,634	720,000	700,000	400,000	414,000	715,000	830,000
Sorghum	164,493	324,000	300,000	150,000	123,000	490,000	380,000
Wheat	182,187	360,000	416,000	325,000	156,500	350,000	430,000
Other Crops	36,796	40,000	56,000	40,000	32,000	36,000	60,000
Total	911,110	1,444,000	1,472,000	915,000	725,000	1,591,000	1,700,000

B. Increased Food Production, Food Storage and Propaganda

50. At the close of this year the quantity of maize, kaffir corn, and to a lesser extent, peas which were offered for sale presented the trading community with a definite storage problem. This would no doubt have been accentuated had there been a sufficient quantity of gunny bags for the transport of grain by pack animal : this shortage of bags led to the construction of large numbers of traditional woven grass storage "bins" in Basuto villages for the local storage of grain either for consumption or for which there was no means of transport to the market.

51. To relieve the storage pressure, 20,000 bags of maize were purchased by Government and exported for use in the Bechuanaland Protectorate. Storage space for the balance of the Traders' holdings was adequate, and in order to fall in line with the policy of the Union Government, the export of any further quantity of maize by traders was prohibited until the position in regard to the crop in the succeeding season was known.

52. *Grain Storage Tanks:* A commencement was made during the year with the construction of 330-bag reinforced cement-brick storage tanks for maize. The present objective is to provide storage for about 40,000 bags of maize. The tanks will be filled in years of plenty, and the contents reserved as a standby for use during the lean years which are bound to recur. Storage for 3,300 bags has been completed at one centre.

53. *Manuring Campaign:* The Department has one hundred two wheeled carts available for loan to Basuto farmers for the purpose of carting kraal manure and ash to the lands. The manuring season lasts for approximately three months, and during this time all carts are working to capacity. A short note was included in the previous Report describing a newly introduced subsidy scheme, whereby Basuto farmers were to receive a payment for the transport to their arable lands of the kraal manure which is normally used as fuel.

54. The scheme has proved most successful as providing the immediate incentive for the return of manure and ash to the soil. During the report year 201,422 bags of manure and ash were carried on to the lands, for which over £1,400 was paid out in subsidy. This quantity of manure represents and increase of 76 per cent over the figure for the previous year (note—1 bag of kraal manure weighs approximately 100 lb. when dry, and eight bags are the equivalent of 1 scotch cart load. The subsidy is paid on the basis of 100 bags being applied to an acre of land).

55. The effect of the subsidy is that many more people are seeing the beneficial effect of manure on their own crops. It is intended to continue the scheme for a further two or three seasons, and it is likely that the increase in the amount of manure applied to the land will continue.

56. Great interest has been shown in the two inexpensive all-steel carts which were put into use in the Leribe District, but so far no purchases of similar carts have been made by individual farmers.

57. *Phosphatic fertilisers:* Only 200 bags of superphosphate arrived in time for resale to Basuto farmers in the season under review. The demand remained strong for the strictly limited supply of the fertiliser which was made available to the Basutoland Government by the Union Controller of Fertilisers. It will not be the policy of the Department to encourage the use of this form of phosphatic manuring until better farming methods become more general.

58. *Seed Sales:* During the year the following sales of seed were made in those districts where seed was in short supply :

Maize	348	bags	of	203	lb.
Sorghum	10	„	„	„	„
Oats	11	„	„	„	„
Wheat	154	„	„	„	„
Beans	6	„	„	„	„

59. *Vegetable gardens and fruit trees:* Many Basuto find difficulty in raising plants of such commonly grown vegetables as cabbages and spinach beet from seed. Sowings of seed were made in district nurseries in order to supply the demand for seedling vegetables, and a ready sale was found for the resulting plants. Basuto who have grasped the technique of raising plants are being encouraged to sell plants to their neighbours.

60. An increase of 254 gardens cultivated with the assistance of demonstrators is recorded, bringing the total of such gardens to 13,280, or approximately one to every nine families.

61. The sum of £54. 10*s*. 0*d*. was paid out in prize money for vegetable garden competitions.

62. Over 1,100 seedling peach trees, 400 apricots, 1,322 rooted grape vine outtings, and 25 quince trees were distributed during the year.

63. *Agricultural Shows:* Nine agricultural and livestock shows were held, at which £119. 0*s*. 0*d*. was collected in entrance fees from exhibitors. A grant of £10. 0*s*. 0*d*. towards prize money was paid by Government in respect of each show, and in some cases the prize array was supplemented by gifts from local traders.

64. These shows are organized by local Agricultural Associations and a relatively high standard of quality amongst the exhibits of produce was general. Livestock entries as usual were disappointing.

65. *Agricultural Associations:* A total of 142 associations were active during the year, with an average membership of thirty five people.

66. *Demonstrators:* The staff consists of forty-three Demonstrators on the £72.–£204. grade, these being men who have had training at one or other of the Schools of Agriculture in the Union of South Africa, with sixty-six Assistant Demonstrators all of whom are on the permanent staff. Their services are supplemented by the work of Temporary Assistant Demonstrators employed under the Increased Food Production drive. Their field work has again given outstanding results. A total of 299 demonstration plots was worked and manured under the supervision of demonstrators, with an average yield of all crops of 912 lb. of grain per acre, to be compared with an average yield of 488 lb. from adjacent lands worked without supervision.

67. Over 800 acres of maize were row-planted behind the plough in parts of the mountain area. This method of planting replaces

the traditional method of broadcasting, and follows naturally on the construction of contour grass buffer strips. Prior to the establishment of the latter, row planting could not be advocated on the steeper slopes as a method of increasing food production, on account of the risk of increasing the "run off" and hence loss of surface soil which the thinner stands and cleaner weeding might cause. The grass buffer strips of necessity bring about ploughing and hence planting and subsequent cultivation along the contour and thus no increase in soil loss is likely to occur.

69. Major routine work continued by Demonstrators included the laying out of grass buffer strips, village tree-planting, lectures on seasonal topics and the dosing of small stock against internal parasites. These matters are dealt with under their respective headings.

69. *Lectures and demonstrations:* Sixty seven lectures were given by Agricultural and Livestock Officers and 842 lectures and demonstrations by Demonstrators to a total attendance of 35,468 Basuto farmers. A school club Field Competition was organized in the Mafeteng District, where school boys worked portions of their fathers' lands under the supervision of the Senior Agricultural and Livestock Officer. This gave an outstanding demonstration of the value of better farming methods, the sons obtaining an average yield of 8·1 bags of maize per acre compared with the fathers' 2·4 bags.

C. Insect Pests and Fungus Diseases

70. No abnormal infestation of insect pests or fungus diseases is to be recorded. Top grub and cutworm took their usual toll from the earlier planted crops and numbers of Basuto farmers are taking advice in the control of these pests. Smut and rust in the wheat crop was not generally severe, in spite of the excessive rains with which the occurence of rust has been associated in the past.

D. Village and Reserve Tree Planting

71. Tree planting during the year was again practically confined to replanting of areas which had failed from accidental fire, drought, or stock trespass. In all 1,514,000 trees were planted, consisting mainly of poplar (*Populus canescens*) and silver wattle (*Acacia dealbata*), with relatively small numbers of various species of conifers and willows.

72. The question of the individual ownership of small tree plantations has not yet been finally settled, but there is every prospect

that the present system of communal ownership will shortly be replaced by a system under which individuals will grow trees for their own personal benefit.

73. An account of the activities of the Assistant Conservator of Forests during the Report year is contained in Section V of this Report.

E. Food Supplies

74. Food supplies during the year were ample for all needs, and in addition permits were issued for the export of the following from Basutoland:

TABLE IV

	Quantity	*Approximate value to producer*
Maize (1947 & 1948 crops)	46,000 bags of 203 lb. gross	£31,000
Wheat	84,000 „ „ „ „ „	71,000
Peas	55,000 „ „ „ „ „	124,000
Sorghum	91,000 „ „ „ „ „	68,000
	Total	£294,000

75. Thanks are again due to the Advisory Committee elected from the members of the trading community of Basutoland for their advice and co-operation in matters affecting food supplies and the disposal of surplus primary products.

F. Grazing

76. For many years work has been in progress aiming at the stablization of the soils of the arable portion of the Territory, details of this work being given in Section IV of this report. Equal, but more insidious soil losses have been taking place in the grasslands where the only method of approach to the erosion problem has been shown, by experimental trial (para. 98) to be a system of rotational grazing. This applies more particularly to the "cattle post" mountainous country, mainly above 8,500 feet level, which comprises perhaps a quarter of the area of the Territory. Control of this country, which is most difficult of access, is complicated by the system of communal grazing which is general in Basutoland.

77. Controlled grazing in respect to perhaps a third of the "cattle post" area was commenced in September 1947 by two of the Senior Chiefs of the Territory into whose wards this area falls. Badly denuded mountain slopes in the area have been completely de-

stocked, the stock being transferred to other areas which in the past have carried little or no stock. When adequate grass cover has become re-established on the slopes which have been destocked, animals will be permitted to return to this grazing on a rotational system, under control.

78. The season was peculiarly favourable to the growth of grass, and the return of grasses into some of the slopes, where the predominating cover for many years has been the shrubby *Chrysocoma tenuifolia*, has been remarkable. These slopes are to remain destocked until such a time as the shrubby growth shows definite signs of suffering from the competition put up by freshly established grasses.

G. Experimental Work

79. Experiments in progress in the Territory may be discussed under four headings: (1) Crop Improvement, (2) Stock Improvement, (3) Grassland Management, and (4) Agricultural Improvement Areas. Experiments are in progress at Maseru (elevation 5,400 feet) and at Thaba Tsoeu and Thaba Putsoa (elevation over 8,000 feet).

80. (1) **Crop Improvement**: The problems under investigation at present are the multiplication of improved varieties of maize, kaffir corn and peas, manuring and crop rotational trials, grass ley trials and introduction of new cash crops.

81. (a) *Wheat:* Three autumn sown (lowland) variety tests and one spring sown (mountain) test of wheat strains were carried to a conclusion. The tests included trials of hybrid strains, new strains received from Canada and multiplied during the previous season, and trials of Manitoba wheats which have been in the Territory for some years. In each case the variety "Talberg", which is commonly grown in the wheat producing areas, was included as a standard for comparison.

82. On account of a dry spell at flowering time the ears of the later varieties were not properly filled, with the result that these did not show up as well in the trials as in previous years. Yields varied from 361 lb. per acre to 1,340 lb. in the lowlands tests, and from 1,435 lb. to 2,272 lb. per acre with spring sown wheat.

83. 9,800 lb. of seed were reaped from a multiplication area of the variety "Ceres". This was sold for seed purposes.

84. The field selections made during the previous year were sown in May 1947 for observations on their characteristics, and for seed

multiplication. It was found possible to discard several strains, and the balance were planted in May 1948 in small blocks for further observation. The variety "Ceres" is included among the blocks as a basis for comparative observations.

85. (b) *Kaffir Corn:* No significance could be attached to the result of a yield test of seven of the commonly grown varieties. Further field selections have been made, and are being multiplied.

86. (c) *Crop Rotational Trial:* In Basutoland it is the custom in the Lowlands, where the larger portion of the arable land is found, to follow a system of monocropping with maize and kaffir corn as the two major crops. Beans, peas and wheat are a minor consideration, and generally speaking lands are traditionally considered as "maize lands" or "kaffir corn lands" as the case may be.

87. For many years an effort has been made to introduce beans and peas more into the farming economy, but there is no accurate information as to the real value of crop rotation, and accordingly an experiment has been designed to give this information.

88. The rotation which is being tested is intended to give four crops in three years, two of which are leguminous. Maize is sown in October and reaped in the following July. Peas follow in September, and are reaped in time for sowing of a winter wheat crop the following May. This is harvested in November, and succeeded by a bean crop, sown in January, and harvested in June.

89. The experiment has been laid out on the randomised block basis, and includes among treatments the continuous cropping with each of the crops. A subsidiary experiment has also been commenced to compare the effect of maize upon the succeeding kaffir corn crop, and vice versa.

90. The first years work on this experiment was satisfactorily concluded.

91. (d) *Grass Ley Experiment:* Previous experimental work shows that on account of a lack of either resistance to frost or resistance to drought, little use can be made of exotic species of grasses in the reclamation work which is required in the Lowlands.

92. In parts of Basutoland soils have become completely exhausted, and are no longer suitable for arable purposes. It is thought that the seeding of such lands, after they have been abandoned, with *Eragrostis chloromelas* or *E. curvula*, may bring about the comparatively rapid regeneration of these soils, and an experiment has been laid out to determine the "rest" period required; the treatments are *Eragrostis chloromelas* and *E. curvula*, Rhodes grass, natural

regeneration and continuous maize. This experiment is divided into two, three, and four year leys which will be planted to maize after the respective periods of rest.

93. A satisfactory growth was obtained from the plots which were sown in October 1947.

94. Seed from *E. chloromelas* and *E. curvula* is very easily obtained. If these grasses produce good results experimentally, it will be possible to apply the practice of grass leys on a wide scale.

95. (e) *Other Crops: Linseed:* Small quantities of linseed of the varieties "Royal" and "Punjaub" were received and planted in December 1947, well on in the growing season. Seed was harvested in 4 months at the rate of 1,040 and 1,440 lbs. per acre respectively, from plots which had the help of a little irrigation water as required.

96. (2) **The Mountain Grassland Problem**: The mountain areas are grazed mainly during the summer. The northern, north-western and north-eastern slopes were originally covered with sweet (*Themeda*) grass, while the colder slopes grew "sour" grasses of which *Festuca caprina* is the dominant species. Stock naturally congregate on the sweet grass, with the result that this has been slowly eaten or trodden out, and its place has been taken by useless scrub, *Chrysocoma tenuifolia* predominating. The grazing value of the mountain slopes has steadily deteriorated; in addition, *Chrysocoma* offers little resistence to soil erosion. A very large percentage of the mountain slopes has been damaged in this way, and it is considered to be the matter of most urgent and vital importance that these slopes should regain their former grass covering.

98. Experiments at Thaba Tsoeu and Thaba Putsoa and elsewhere where controlled grazing is in progress indicate that a return to *Themeda* may be achieved by simple restriction of stocking and rotational grazing. At Thaba Putsoa, an area which twelve years ago was covered with *Chrysocoma* and at that time was fenced, the return to *Themeda* is practically complete. This is now being used for the determination of carrying capacity of mountain slopes which have returned to their climax vegetation. Alterations in vegetation are being checked by a system of transects, where the botanical composition of the cover is determined from time to time. The results of these observations will, however, have no immediate application.

99. The Paramount Chief has set aside an area of 1,150 acres at Thaba Tsoeu on which the good effects of rotational grazing may be demonstrated. Control was commenced four and a half years ago, and consists of a simple arrangement, whereby the grazing is completely rested every third year. The grazing, as with most of

the "cattle post" areas, is only used during the six summer months 100. The results of this demonstration are proving extremely satisfactory. There has been a large increase in the percentage cover, and also in the amount of *Themeda triandra*, the climax species, to be seen. The Bitter Karroo Bush, *Chrysocoma tenuifolia* is no longer the dominant species, most shrubs obviously being unable to withstand competition with grass or the damage caused by a wood borer. The latter appears to thrive where there is adequate grass cover. Since this area is not fenced, control being maintained by herdboys, the demonstration is well suited for general application.

101. (3) **Improvement of Stock**: Reference has been made in para. 18 to the breeding of a herd of native cattle of proven milk producing capacity. As this work is of an experimental nature, the account of the progress made is contained in the Experimental rather than the Livestock and Veterinary section of this Report.

102. The herd has been built up from locally purchased cows which are being mated to an Afrikander Bull from one of the best milking strains which is known in this breed. At the end of the report year there were 98 cows and heifers in the herd.

103. Milk producing ability combined with ability to thrive under adverse conditions are being used as the first criteria in culling. Each cow is given two lactations upon which it is judged, and the stage is now being reached where extensive culling is possible. As soon as satisfactory bulls are produced, and by satisfactory is meant bulls apparently possessing the necessary stamina, and from female parents which show a milk producing ability well above average over two lactations, these bulls will replace the Afrikander bull at present in use.

104. The following figures are of interest as a basis for comparison of the Basutoland native cattle with European breeds. In interpreting the figures, it has to be borne in mind that the cows receive no supplementary feed, and that they are kept in other ways in a manner as nearly as possible similar to that which is traditional in Basutoland.

105. Number of completed recorded lactations, 71. Average length of lactation (longest 430 days, shortest, 8 days), 189 days. Average yield per lactation (highest 3,339 lb. lowest 6 lb.) 1,153 lb. Average "dry" period (longest, 513 days, shortest 75 days) 272 days. Average daily yield per cow (including dry period) 2.5 lb.

106. From the figures contained in parentheses, it is evident that there is an enormous variation in individuals, from which it

is fair to assume that a large general improvement in the progeny average milk yield can be brought about in a few generations.

107. (4) **Agricultural Improvement Areas**: At Maphutseng an experiment is in progress to demonstrate the value of the application of the combined policy of the Department.

108. The area which is under treatment is approximately 3,700 acres in extent. It carries at present a population of 179 families or 793 individuals. At the commencement of the experiment there were 1,182 acres of cultivation, and 2,511 acres of grazing grazing ground which carried a stock population of 492 head of cattle, 46 horses, 49 donkeys and 572 head of small stock.

109. The essence of the scheme lies in the reduction of stock to the rate of one head of large stock or the equivalent number of small stock to five acres of grazing land combined with a system of rotational grassland management, the removal from cultivation of arable land on slopes too steep for arable purposes (to which the concomitant is the re-allocation of arable land), and the setting aside of tree lots for the provision of firewood and building poles.

110. Progress with the work has been hindered by a certain lack of co-operation from the chiefs concerned, but to date changes have been accomplished as outlined in the following paragraphs.

111. 155 acres have been beaconed off and set aside for the tree planting purposes. This has been taken mainly from the grazing areas, and partially planted to trees.

About 250 acres have been taken out of cultivation, and allowed to revert to grass. The grazing area is thus now 2,606 acres. This has been beaconed off into three roughly equal sections, each of which will be completely rested every third year.

112. The rate of stocking is at present 3·7 acres per head of large stock or its equivalent. The whole question of stock reduction is complicated by the fact that numbers of stock are grazed on contiguous areas where no grazing regulations are enforced, which makes it practically impossible to say exactly what rate of stocking is being maintained. Limitation of stock (i.e. a reduction of 1 head of large stock to 5 acres) has not yet been attempted.

113. Plans are under way, and the principle has been accepted by the people, for the re-allocation of land on a family-size basis. This will be proceeded with after the crops have been reaped during the coming year.

114. Two dams for the watering of stock have been completed, as has the contouring of the cultivated areas.

115. The grounds attached to the Mission School in the Maphu-

tseng area are, with the co-operation of the Paris Evangelical Missionary Society and the Department of Education to be used as a training farm. Pupils at this school will be trained on a curriculum with a definite agricultural bias, and it is hoped that the use of better farming methods in the area will be stimulated by the existence of this school.

116. The Department of Agriculture is to be responsible for the loan of certain simple items of equipment and the part-time services of a demonstrator for use at this Institution.

SECTION III

LIVESTOCK AND VETERINARY

Economic Aspect

117. The period under review, October 1947 to September 1948, may be described as favourable, not only in respect of conditions necessary to the growth and maintenance of livestock but also in respect of the economic situation relative to markets and prices ruling for animals and animal products. The rainfall of about 32 inches was adequate for the maximum growth of natural veld grazing, although owing to overstocking this was, as usual, exhausted before the end of the winter months and some mortality undoubtedly occurred from this cause. The winter period however was exceptionally mild, long periods of low temperatures and hard frost being notable by their absence : in addition, in the lowlands, stock were favoured in having an exceptionally large area of maize stover left from a successful cropping season upon which to subsist.

778. Due to the continuing meat scarcity in the Union, there was a ready and active market for all cattle and sheep offered for sale and export. It is pleasant, having regard to the general overstocked condition of the Territory, to record that there was a significant increase of cattle exports, viz, 10,000 head in comparison with the previous year's figure of 6,322. Auction sales, after the lapse of some years were resumed at Qacha's Nek, and as result the figures of livestock sold by this method, as well as the average prices realized, both show increases over the previous year. Sheep are rarely disposed of at public auction—at any rate in the western areas of

Basutoland—and it is therefore gratifying to record with the resumption of sales at Qacha's Nek, a total of 504 head were sold there. There is generally an unsatisfied market for mutton and goat flesh in Natal, and an increase of sheep and goat exports from the eastern districts of Basutoland, a result greatly to be desired, may be facilitated by the resumption of auction sales in this area.

Statistical Review

119. The usual biennial census will be taken in February 1949, but it may be remarked here that there is nothing to suggest that there has been any reduction in over all numbers since 1947: the country remains overstocked, and restrictions upon the further importation of livestock, introduced over eighteen months ago have proved fully justified.

120. Many complaints have been received, particularly in regard to the virtual embargo upon importation of donkeys, but it is confidently anticipated that this animal—whose value of usefulness is solely related to transport purposes and in substitution for horses and oxen which were the animals used exclusively in an earlier period—has already multiplied in the country to a degree which justifies stringent measures upon further introductions. This traffic is encouraged by the cheap prices at which donkeys are generally obtainable in the Union, as low as a few shillings apiece. At a conference convened by the Director of Livestock and Agricultural Services and attended by representatives of the Basutoland Chamber of Commerce, most of whom own or control stores in the mountain areas, a peculiar situation was admitted viz. that many traders rely upon hired donkey transport to move wheat and wool down to the lowlands, but in seasons when there is plenty of food, Basuto are disinterested in tendering for such services. The number of donkeys available in any area therefore bears a variable relationship to its essential transport requirements, viewed as a whole, and some traders prefer to rely upon their own donkey transport. Basically, the whole problem derives from the circumstances that in Basutoland a large proportion of the adult male population find it necessary to emigrate to the Union for work on the mines and farms, and the donkey as a pack animal is popular because it is more easily controlled by those Basuto remaining at their homes, women and children particularly, than horses or oxen. However, the donkey economically speaking is something of menace at all times and it was recommended at the meeting referred to that future introductions to lowland areas be prohibited

completely, and only a limited number be allowed to mountain districts where there is a genuine need for such.

121. Note has already been made of the restrictions introduced in 1947 upon numbers of livestock brought into Basutoland, and it is interesting to note the results.

TABLE Va.—STOCK IMPORTS

	Cattle	Horses	Mules	Donkeys	Sheep
1946-47	15154	2063	221	429	11210
1947 48	16201	2103	141	175	7722

From this it appears that there has been little change; but it may be remarked that there is good reason to assume that these numbers would have been considerably greater, had no limits been imposed, and also that in some cases individual Basuto have acted as importers whereas they were in fact the agents of others interested in obtaining larger numbers. In the absence of a Stock Register System, and frequent check, it is at present impracticable to detect and prove such irregularities.

122. Exports for the same periods are as follows:

TABLE Vb. STOCK EXPORTS

	Cattle	Horses	Mules	Donkeys	Sheep
1946 47	6322	212	—	—	2561
1947–48	10000	179	8	187	2848

As will be noted, there has been an increased export of 3678 head of cattle but at the figure of 16201 head importation of cattle still exceeds export by 6201.

Exports of hides and skins over the same periods are:

TABLE Vc.

	Cattle Hides	Sheep & Goat Skins
1946 1947	31989	32834
1947 1948	36420	65672

123. Issue of vaccines, and medicaments, have in some cases shown marked increases: viz. anthrax vaccine from 17691 to 23307 doses and quarter evil vaccine from 7628 to 10809 doses: such statutory services as double dosing of small stock, castrations etc. have remained at the usual level.

It may be remarked here that the demand for relatively expensive medicines, particularly Sulpha drugs, for such conditions as strangles in equines, makes it difficult to meet Government and public requirements from the funds available; it has frequently been found

necessary to limit the issues of such to cases of a severe description, and to indicate older and cheaper remedies for the milder cases. Alternatively, it was considered advisable to refer applicants who demanded such remedies to private sources of supply. The general situation indeed in such respects reflects the higher standards of public knowledge, both European and African, relative to stock diseases and treatment of animals.

Animal Health

124. This remains on the whole in a reasonably satisfactory condition, subject always to the consideration that animals live for a considerable part of each year on what may fairly be described as bare subsistence. It will be appreciated therefore that stock, particularly large stock, are relatively slow growing. It has been noted by exporters who have removed cattle to grazing areas in the Union, that a rapid improvement in growth and weight is almost an invariable result of the change.

Disease Control

125. A total of 69 smears, mostly from the Maseru area were examined during the year, three of which were anthrax positive, and one from a case of quarter evil. It has to be noted that any outbreak of disease involving a number of animals is generally reported, whereas the death of single animals, a common occurrence in Basutoland due to malnutrition, injury or other obvious cause, is taken as a matter of course. New diseases e.g. lumpy skin disease as experienced up to a year ago, were generally reported to or observed by the district staff at an early stage.

126. *Anthrax:* There was one severe outbreak in the Mafeteng district, from which a number of animals died, but this was quickly stamped out by inoculation of all animals, exceeding a thousand head, in the area concerned. In other districts considerable quantities of vaccine were utilized where anthrax was known to have occurred and where preventive inoculation was requested.

127. *Quarter Evil:* Although only one case of quarter evil was diagnosed by blood smear examination, the disease is so widespread, and so easily identifiable by external symptoms, that a better indication of its prevalence is the increasing demand from Basuto cattle owners for the inoculation of the younger categories of cattle. This demand is increasing from year to year. It is possible indeed, that this disease is the cause of more mortality than any other,

including gall sickness, and it is fortunate that its incidence is so easily controlled by preventive inoculation.

128. *Anaplasmosis (gall-sickness):* Only 181 doses of this vaccine were ordered and utilised in comparison with 712 doses during the previous year. As this vaccine is mostly ordered for European owned livestock it is to be assumed that owners are satisfied that the disease is less prevalent than was assumed in years past. It is likely indeed that for indigenous cattle the disease is of little significance, but may occur in greater degree in improved types e.g. dairy cattle introduced from areas where the disease is unknown.

129. *Lumpy skin disease:* This epidemic disease has now run its course, having invaded all four provinces in the Union, but outbreaks in Basutoland were restricted so far as is known to the western areas of Basutoland. No mortality was reported, but the skin lesions were in some cases associated with disturbance of general health and some loss of condition. Working oxen with limb lesions had of course to be put out of work for periods up to a month, or even longer, due to lameness.

130 *Equine disease:* Strangles and equine mange have been prevelent; many cases of strangles have been of malignant type, resulting in death. The usual sulpha drugs are generally specific for this disease, administration in sufficient quantity producing a rapid abatement of the symptoms. Unfortunately they are frequently, relative to the value of the animal concerned, expensive to use, so that it has been found necessary to restrict their application to the severer type of case.

131. *Other diseases:* In the course of a year officers are called upon to deal with most of the commoner diseases of all domestic animals including poultry. The absence of severe endemic disease in Basutoland e.g. East Coast Fever in cattle, sheep scab, etc. furnishes an opportunity to deal with the minor disorders of livestock e.g. mastitis in cows, and to provide services which are not generally available from Government sources. Thousands of doses of various types of medicines are issued or dispensed in the course of a year, and such services as inoculation, dehorning of cattle, etc. are in practically every case performed by officers of Government instead of by the owners themselves.

Animal Husbandry

132. Small Stock : 1,188,902 lb. of wool was classed under Government supervision. This excludes wool classed by traders themselves, on Government standards.

133. The simple classing of wool by flock owners was more popular during the year, and all wool tendered for sale to traders was certified "simple classed" by Government Wool Inspectors, posted at all Trading Stations.

134. The following Table gives a comparison of Government classing over the last three seasons.

TABLE VI.—WOOL STATISTICS

	1945/46	1946/47	1947/48
(a) No. of sheep shorn under Official supervision	175,225	233,234	214,923
(b) Poundage of wool	1,041,200	1,280,728	1,188,902
(c) Average poundage per sheep	6·88	5·49	5·53
(d) Percentage of combings	27·65	40·29	25·20
(e) Percentage of shorts	29·70	9·37	21·38
(f) Percentage of XM	6·95	7·75	9·81
(g) Percentage of out-sorts	35·75	42·51	43·61

135. The total quantity of wool exported during the year was 10,319,947 lb. and 1,496,998 lb. of mohair was exported. The estimated total value to the producers of wool was £774,000, and £112,000 in the case of Mohair.

136. These figures indicate an increase of 235,038 lb. of wool exported over the previous season, and an increase of 303,067 lb. of mohair exported.

137. A very steady increase in the price of wool was recorded through the year. Top lines from Government imported Rams realised up to 44*d.* per lb. at the coast. At the end of the year under review, prices were considerably higher than the average for the year.

TABLE VII

Average Wool prices of Government classed wool sold at coast

C. 1	23*d.*–24*d.*	per	lb.
C. 2	21*d.*–22*d.*	„	„
S.S.	20*d.*–21*d.*	„	„
S.	16*d.*–18*d.*	„	„
C.B.P.	15*d.*–16*d.*	„	„
Lox.	8*d.*– 9*d.*	„	„
Backs.	10*d.*–12*d.*	„	„

138. 597 Merino Rams were introduced into the Territory from the Union for re-sale to sheep farmers. Difficulty was experienced in obtaining this number of rams from the breeders in the Union. A commencement was made during the year with an extension of the number of shearing and wool classing sheds in the mountains. Twelve such sheds were constructed ; it is expected that the gradual

increase in the facilities available will lead to a corresponding increase in the amount of Government classed wool, in which the buyers at the coast are particularly interested.

139. At the close of the year the question of the economics of the goat and mohair industry in Basutoland was discussed at length by the Basutoland National Council. The matter of improvement of yield of mohair per goat by the introduction of well-bred Angora Rams was agreed to as a policy which should be adopted, and further, it was agreed that the goat population should be reduced. Ways and means of effecting reduction are to be discussed by a representative committee of Basuto.

140. *Cattle:* Mention has been made in paragraphs 101–106 of the commencement of work on the improvement of indigenous cattle. In addition to this all that can reasonably be done by officers of Government, e.g. castration of undesirable or redundant male animals, the dosing or treatment of sick animals etc. is being carried out as a form of encouragement to the progressive type of owner.

141. There has been a heavy mortality during the year, due to age principally, amongst the 206 bulls listed as Government issues in the last report. It is probable that the number now does not exceed 170, and it is to be expected that this number will again be greatly reduced in the near future. At the time when these bulls were issued, some years ago, it was considered that the Afrikander was, for general purposes, the most desirable type ; but this conclusion does not meet with the same acceptance today, and there are many who consider that dual purpose hardy animal, e.g. Brown Swiss would be more appropriate.

142. *Equines:* 22 Stallions, all Thoroughbred with the exception of one pure-bred and one high grade Arab are at stud, or on loan to private owners. During the year attention has been given to improvement of the indigenous animal by the substitution of a smaller type of sire e.g. Arab, Welsh Cob, etc. for the Thoroughbred, and a scheme for the improvement of the Basuto Pony on these lines has been proposed. The high grade Arab mentioned was purchased (for £80) in anticipation of such a change in general policy, but it is admitted that it will probably prove difficult to wean the average Mosuto from his predilection for a racing type of animal.

143. 14 Government owned Donkey Jacks of Catalonian type were in use during the year. There was a considerable demand for their services for mule breeding, and an additional animal is being purchased to stand at Quthing. 141 Mules were introduced into Basutoland during the period under review.

144. *Pigs:* The demand for weaner pigs is still very good in spite of price being raised from 10/- to 20/-. Four sows, Large Black, are kept and two boars, one Large Black and one Tamworth. During the year 58 weaners were sold.

145. *Poultry:* The demand remains good and it is not possible with present equipment to hatch sufficient chicks to meet the demand. 180 Fowls 4-5 months old were sold during the year. Breeds kept are Rhode Island Red, Light Sussex and Australorp.

Marketing of Animals and Animal Products

146. As noted previously, 19 Auction Sales of Livestock were held during the year, at which 2,381 cattle were sold for £28,705. This represents an increase in numbers and per capita value over the previous year, as shown in Table VIII.

147. Despite doubts expressed in the previous report as to the support which might be accorded to future Auction Sales, it was found possible to maintain these at the usual centres although this necessitated considerable pre-advertising by the Auctioneers, in order to ensure adequate supplies. The number of cattle sold by this method, and exported for slaughter and consumption in the Union, represents about 23 per cent of the total cattle exports. The bulk of the traffic thus still remains in private hands.

TABLE VIII

148. *Cattle Sales*

Report Year	No. of Sales	No. of Cattle Sold	Total Sum Realized			Average Prices		
			£	s.	d.	£	s.	d.
1938–39	10	257	1,560	14	7	6	1	5½
1939–40	11	784	5,042	17	6	6	6	7¾
1940–41	18	2,303	14,740	19	6	6	8	0¼
1941–42	18	2,539	20,701	6	6	8	3	0¼
1942–43	25	5,370	52,844	19	6	9	16	9
1943–44	22	3,423	34,150	16	6	9	19	6
1944–45	19	3,321	35,516	4	0	10	13	10¾
1945–46	19	1,862	23,461	17	6	12	12	0
1946–47	13	1,133	11,899	15	0	10	10	0
1947–48	19	2,381	28,705	15	0	12	1	0
Total	174	23,373	228,625	5	7			

149. As usual, opportunity was taken at the periodic Auction Sales to dispose of cast, unwanted, or redundant Government owned livestock. Excellent prices were obtained for sub-standard milk cows from the Botsabelo Leper Settlement. Most of the purchases

of slaughter stock for consumption at the same institution were, as a matter of policy made at local auction sales.

150. *New Legislation:* None.

SECTION IV

SOIL CONSERVATION WORK

Staff

151. The anti-erosion work is under the supervision of the Soil Conservation Officer who, in addition to his general administrative duries, supervises the constructional work in the Maseru district.

152. Constructional work in the districts is in the direct charge of either European or African foremen and supervised by District Agricultural & Livestock Officers.

153. There are now five European and three African foremen in charge of the eight tractor gangs working in the Lowlands.

Weather Conditions

154. It has been an exceptionally trying year for conservation work. During the first quarter conditions were dry ; during February and March it rained almost incessantly, and soil conditions were too wet for heavy plant to operate satisfactorily, and sixteen wet days during March reduced labour days considerably. No rain fell during June, July, August and September, so soil conditions again became very hard. Thus during the year under review there were only three moths when conditions were reasonably favourable. The one redeeming feature was that, due to the mild winter and absence of snow in the mountains it was possible to work right through the winter laying out Buffer Strips. This work is frequently held up for several months on the higher Southern slopes due to frozen conditions of the soil. Total rainfall for the year under review was 32 inches. Most of this fell in short heavy storms which did considerable damage.

Plant

155. The only new plant acquired during the year was a Fordson Major tractor and two Adams No. 84 Graders.

156. After thorough trials with the Fordson equipped with tyres, it was found quite unsuitable for construction work such as terracing and dam making. The half tracks only arrived in June. These tracks reduced wheel spin considerably, but the machine has not sufficient power for any of the existing terracing plant. It works very satisfactorily however on dam construction, pulling an 18 cu. ft. buck scoop, and for marking terraces which are not on too great a slope. The two Adams graders are satisfactory, and operate well behind RD 4 tractors.

157. During the year four trailers equipped as operators huts were acquired. These obviate unnecessary travelling.

158. The original 22 tractor purchased in 1936, which had completed 13,000 hours, was in a bad state of repair and should have been boarded, but in view of the difficulty in obtaining new machines it was completely overhauled and returned to service.

195. The two RD 4 tractors have been overhauled by the Departmental mechanic and are still running well. The four D 6 tractors, and the two later model D 4 tractors are giving excellent service.

160. The total cost of repairs and spare parts during the year was £3,177.

Oxen

161. Each Tractor gang has 20 oxen. On account of better soil compaction oxen are used on dam construction, and for forming gully crossings in preference to the tractor. In the event of the tractor being out of commission, oxen can be used on the Eaton ditchers thus avoiding the complete cessation of operations.

Work Done

192. The progress made in the principal sections of the work is shown in the following schedule :

TABLE IX

Measure	Prior to 1948	During 1948	Total to end of 1948
Area terraced-Lowlands (acres)	199,655	27,205	226,860
Length of terrace (yards)	20,628,968	2,740,751	23,369,719
Buffer Strips-mountain (acres)	164,203	38,654	202,857
Diversion Furrows—„ „	26,176	19,582	45,758
„ „ (yards)	578,690	488,887	1,067,577
Dams constructed	238	21	259
Trees planted	835,504	11,998	847,502

164. The above figures for the year under review are made up from District totals as shown below :

TABLE X

District	Area terraced, (acres)	Area protected by Diversion Furrows (acres)	Area protected by Buffer Strips (acres)
Butha Buthe	4,338·0	226·0	5,124·6
Leribe	3,087·0	—	1,774·9
Teyateyaneng	3,204·0	197·0	1,444·1
Maseru Mountains	—	2,490·0	1,975·4
Maseru, Gap	4,201·0	—	—
Matsieng	2,629·0	—	—
Mofokas	3,533·0	—	—
Mafeteng	2,275·8	273·4	1,190·8
Mohale's Hoek	3,937·0	220·4	1,649·1
Quthing	—	480·0	6,634·0
Qacha's Nek	—	6,668·8	6,605·7
Mokhotlong	—	9,026·2	12,165·8
Total	27,204.8	19,581·8	38,654·4

165. (a) *Terracing in Lowlands:* The area terraced or bunded in the Lowlands is 27,204 acres, the highest annual total so far recorded. This is partly due to the fact that in comparatively flat rolling country, heavy banks have been interspaced with Buffer Strips 6′–9′ wide at the usual 6′ vertical interval as described in the 1947 Annual Report. This system has not proved entirely satisfactory, as in some areas it has been found that there is too much accumulation of flood water between the terrace banks or graded "Bunds", as they will be termed in future, and in consequence there have been numerous breaks. However, as the season has been a difficult one, the system cannot be condemned entirely; it is proposed to try it for another year at least.

166. The cost per acre was 10·05/- which is 9*d*. per acre more than last year. This is due to some gangs not having sufficient labour to form an economical unit. 1,488,983 cubic yards of earth were moved in construction the 2,704,751 yards or 1,557 miles of terrace completed during the year. The mean cost was 6 - per 100 yards or 1·1 - per 10 cu. yd., which is slightly cheaper than last year.

167. (b) *Dams:* The 21 dams constructed have a capacity of 38,874,150 gallons making the total capacity for dams constructed to date 425 million gallons. The cost of construction for this year works out at 4·05/- per 10 cu. yds. of wall and 0·37/- per 1,000 gallons water impounded. This is a reduction of 1·6 - per 10 cu. yds. on 1947 costs, which reduction can be attributed to the introduction of larger buck scoops.

168. During the very dry winter these dams have been of in-

estimable value for watering stock. Most of the dams held water throughout the 4 months drought.

169. (c) *Tree Planting:* The season has been an unfavourable one for tree planting. Planting in gullies has again given the greatest percentage "take".

170. (d) *Fencing:* Most of the fencing erected was for the protection of dam walls. The material used was dismantled from old established plantations or Meadow Strips. 23·5 Acres were enclosed at a cost of £45. 15*s*. 3*d*.

171. (e) *Beaconing:* Numerous Meadow Strips have been beaconed off. These beaconed areas have proved very useful during the drought as in many areas they provided the only grazing for large numbers of cattle during the winter.

172. (f) *Grass Planting:* It was a most unfavourable season for the planting of grass. £310. 3*s*. 1*d*. was spent in this most important work. Gully banks once established to Kikuyu are considered to be safe from any but the most abnormal floods, and in addition Kikuyu appears to have withstood the winter drought better than some of the indigenous grasses.

173. (g) *Grass Spillways:* 10 Grass spillways were laid out during the year at a cost of £69. 0*s*. 6*d*. The grass has died in some of the old spillways, which will mean re-sodding will be necessary when conditions become favourable.

174. (h) *Buffer Grass Strips:* Due to more favourable conditions prevailing in the mountain areas there was an increase of 4,515 acres protected over the area protected during the previous report year. This is most satisfactory as last year it was estimated that there would be a reduction in the output of Strip work due to the fact that in the more accessible areas grass stripping in the larger blocks of cultivation had been completed, and only isolated lands remained to be stripped. This figure, however, includes a number of virgin lands which were actually marked out by the owners, which was done at no additional cost.

176. The cost of setting out these 16,341,056 yards of strips was £3,318. 6*s*. 8*d*. or 1·7/- per acre. In some areas the strips have completely grassed over and are indeed acting as Buffers for spreading flood water and holding silt, but in many valleys the results are still disappointing. In spite of seeding with various species of indigenous grasses, these strips are still bare, apart from the annual growths of rescue grass and khaki bush. On certain slopes which are exposed to high winds, it is still necessary to re-mark the strips each year before the ploughing season commences.

176. (i) *Mountain Diversion Furrows:* There has been a slight falling off in this work due to the fact that in some districts the people were not prepared to take on the work at the prices laid down for standard sizes of banks. It is now proposed to pay up to 25/- per 100 yards for 6′ wide furrow, 20/- for 5′ and 15/- and 10/- per 100 yards for 4′ and 3′ wide channels. Every furrow is to be made wider at the discharge end and in future the grades will not exceed 1 in 25, as it has been found that bad scouring takes place on some soils where this grade is exceeded. 488,887 yards of Diversion Furrows were dug, and as it has not been found possible to survey the area actually protected, check surveys have again been carried out. It has been established that on the average 100 yards of furrow protect 4 acres of cultivated land. Previous computations were made on the basis of 100 yards protecting 4½ acres. Remarkable progress has been made in the Qacha's Nek and Mokhotlong districts, where large valleys have now been completed. The work is also taking on well in the Maseru district. The mean cost in the season under review was 19·7/- per 100 yards or 4·9/- per acre. This is 6*d.* per acre more than in the previous year.

Maintenance

177. The National Treasury voted £2,000 for this very necessary work of which £1,974 was spent. In some districts very little trouble is encountered, but in certain areas the maintenance men have to be constantly on guard to prevent incorrect ploughing. In certain mountain areas Buffer Strips are still being wilfully ploughed out.

Transport

178. Three new ¾ Ton Ford V8 trucks were purchased during the year.

Costs

179. (a) The total cost of all Conservation Work in the Lowlands was £13,678. 14*s.* 0*d.* This includes the cost of dams, spillways, fencing and tree planting, but excludes the purchase and depreciation of the plant and equipment, the salaries and allowances of the Soil Conservation Officer and Agricultural Officers and the overhead Administrative charges.

180. (b) The cost of laying out Buffer Strips was £3,318. 6*s.* 8*d.* This does not include Demonstrators' salaries, purchase of oxen

and overhead expenses. The cost per acre is 0·1/- more than in the previous year.

181. (c) *Mountain Diversion Furrows.* Cost £4,814. 5*s*. 1*d*. for the 259,921 yards of 6′, 212,107 yards 4′ and 16, 859 yards of 3′ furrow. These costs include wages paid to repair gangs in the Mokhotlong district, and a certain amount for the building up of gully crossings, which work is not included in the contract prices.

182. Visit to the Union: The Soil Conservation Officer inspected the Vlekpoort Conservation District, to study the system there in use of constructing concrete arch and stone weirs across dongas, and the building up of Drop Inlets above road culverts.

SECTION V

FORESTRY

183. The principal achievement of the year has been the preparation of a solid foundation on which development plans to meet the needs of the country may be based.

184. The initial training of nurserymen was completed, and nurseries were opened at Mafeteng, Mokhotlong, and Qacha's Nek. These nurseries are doing well, although, particularly at Mokhotlong, further experience is necessary to adjust the timing of nursery operations to the peculiarities of the climate. The training nursery at Peka was enlarged and was in a position to sell a few trees, though it was unable to cope with the demand occassioned by the wet planting season. Later investigation showed that the trees sold were doing well and the indications are that the adopted nursery technique of planting and transplanting with planting boards into raised beds was satisfactory for the season under review. The rapid distribution of stock when planting conditions are favourable to accessible centres throughout both lowland and mountain remains however the major problem in the sale of bare rooted trees.

185. Technical advice, assistance, and demonstration, were extended where requested to other departments, missions, traders and members of the Basuto public. By the end of the period three Forest Rangers were in training at Peka to facilitate the dissemination of advice and to give assistance throughout the country. Planting plans were in preparation for the Government camps of Butha-Buthe and Qacha's Nek and that for Mokhotlong was completed

186. The small scale experiments at Peka were continued and a sample plot was marked and measured in the deodar there to obtain some data on growth increment in Basutoland.

SECTION VI

CONCLUSION

Financial Statement

	Revenue	Expenditure
187.	£968	£63,708

188. *Visits:* The progress which has been made in Basutoland with soil conservation work continues to arouse considerable interest. Visitors during the year included Dr. Phillips and the soil conservation students from the Witwatersrand University, Dr. Meredith, Dr. Ross, Mr Dougherty, and Professor Davel of the United States Conservation Services, representatives of the Swaziland and Bechuanaland Departments of Agriculture, and Mr. da Silva, the chief soil conservation officer in Moçambique.

189. *Acknowledgement:* It is with pleasure that I record the thanks of Mr. Leckie and of myself to the members of the Agricultural Staff for their contribution in bringing to a satisfactory conclusion another year of progress, and more particularly for helping to build up the fine esprit de corps which exists at present.

P. A. Bowmaker
Acting Director of Livestock and Agricultural Services.

APPENDIX A

DEMONSTRATION SMALLHOLDINGS—POSITION AS AT 30TH SEPTEMBER, 1948, FOR THE YEAR ENDING 30TH SEPTEMBER 1948

	Mohale's Hoek								Maseru							
	Consumed or on hand				*Sold*				*Consumed or on hand*				*Sold*			
	Quantity	Value			Quantity	Value			Quantity	Value			Quantity	Value		
	lb.	£	s.	d.	lb.	£	s.	d.	lb.	£	s.	d.	lb.	£	s.	d.
Wheat	2,000	12	10	0					700	4	7	6				
Maize	2,800	13	6	0					1,000	4	15	0				
Sorghum	4,600	23	0	0	400	6	7	0	1,200	6	0	0	1,000	5	0	0
Beans and Peas	1,800	22	2	0	120	1	15	9	400	4	10	0				
Potatoes	480	7	5	0		4	5	0								
Vegetables		3	0	0						1	10	0				
Livestock increase in valuation		44	10	0						5	0	0				
Milk	600 galls	30	0	0			15	0	120 galls.	6	0	0				
Eggs	90 doz.	4	10	6					90 doz.	4	10	0				
Livestock Sales & Progeny		16	15	0		36	5	0		1	10	0		9	4	6
Forage					1,500	4	12	6								
Totals		£176	18	0		£53	19	6		£38	2	6		£14	4	6